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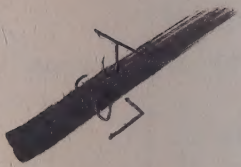

WESTON®
MODEL 1293

BI POLAR
DIGITAL PANEL METER

U.S. Patent 3,051,939
and Patents Pending

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365-5700

WESTON INSTRUMENTS DIVISION
WESTON INSTRUMENTS, INC.
614 FRELINGHUYSEN AVENUE, NEWARK, N. J. 07114
a Schlumberger company

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GENERAL SPECIFICATIONS *

Minimum Range	00.0 to 400.0 Millivolts D. C.
Out Range Indication	Above 4000---Blink
Rated Accuracy	±0.1% of Full Scale ±1 digit
Input Resistance	100 Meg Ohms
Common Mode Rejection Ratio	80 DB with 1000 ohm unbalance at 60 Hz
Normal Mode Rejection Ratio	35 DB at 60 Hz
Speed	0.20 seconds per reading
Response Time	3.0 seconds
Max. Voltage Overload	60 Volts D. C.
Stability	±0.1% Full Scale
Power	117 Volt Nominal, (105 to 129) 60 Hz 8 watts
Weight	1 lb. 4 oz.
Operating Temperature	15°C to 35°C
Extreme Operating Range	5°C to 45°C
Storage Temperature	-40°C to 70°C

Refer to Table 1 for a tabulation of specifications pertaining to specific instruments.

*Specifications subject to change without notice

Note: The Model 1293 is available as a 50 Hz unit, under a different type number.

TABLE 1.

TABLE OF SPECIFICATIONS *

WESTON® PART NUMBER	RANGE (DC)	SENSITIVITY	INPUT IMPEDANCE	FULL SCALE PRESENTATION	NAME PLATE DATA	MAXIMUM VOLTAGE OVERLOAD	EFFECTIVE COMMON MODE REJECTION AT 60 Hz
1293-0270904	1000 Volts	1.0 V	10 Meg	1000	Volts DC	1100 V	Minus Terminal GND
1293-0270903	400 Volts	0.1 V	10 Meg	400.0	Volts DC	1000 V	74 DB
1293-0270902	40 Volts	0.01 V	10 Meg	40.00	Volts DC	1000 V	80 DB
1293-0270901	4 Volts	0.001 V	1000 Meg	4.000	Volts DC	120 V	80 DB
1293-0270900	400 Millivolts	0.1 MV	100 Meg	400.0	Millivolts DC	60 V	80 DB
1293-0270910	400 Milliamperes	0.1 ma	1 Ohm	400.0	Milliamperes DC	---	---
1293-0270909	40 Milliamperes	0.01 ma	10 Ohms	40.00	Milliamperes DC	---	---
1293-0270908	4 Milliamperes	0.001 ma	100 Ohms	4.000	Milliamperes DC	---	---
1293-0270907	400 Microamperes	0.1 μa	1 K Ohms	400.0	Microamperes DC	---	---
1293-0270906	40 Microamperes	0.01 μa	10 K Ohms	40.00	Microamperes DC	---	---
1293-0270905	4 Microamperes	0.001 μa	100 K Ohms	4.000	Microamperes DC	---	---

*Specifications subject to change without notice.

Max. voltage between common input terminal pin 10 and earth ground or shield pin R (500v RMS AC/DC) except on the 1000v range.

No overrange Capability.

GENERAL

The Weston Model 1293 Digital Panel Meter is a miniature single range, Bi-polar, high input impedance instrument designed to indicate input DC voltage or current in one of 11 possible ranges. The display is digital rather then the previous standard analog moving pointer method. Full scale is 4000 digits. All design features are in keeping with panel meter usage but the digital concept provides linearity, high accuracy, stability and speed of reading without consideration of such factors as parallax, reader interpretation or tracking inherent in analog devices.

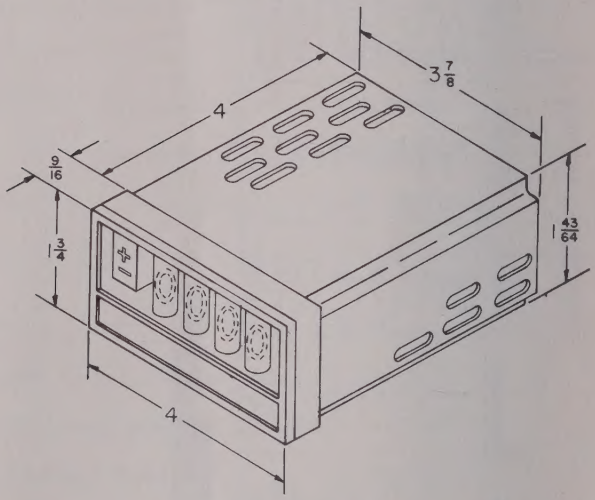


Figure 1. Outline Dimensional Drawing

The meter is provided with an automatic out-range indication. The 4000 "4" will blink above the full scale reading.

Plus "+" and minus "-" indicators are provided to indicate the polarity of the signal being measured.

Three decades of 1-2-4-8 BCD (Binary Coded Decimal) and the 1, 2, 4 (1000 decade) are provided as features. The display hold is provided to hold the last reading displayed on the readout tubes and the BCD outputs, but allows the conversion process to continue. The polarity hold is provided to hold the last polarity indication, but allowing the instrument to continue measuring the input signal. The BCD decades are used to provide outputs to drive external equipment. External selection of decimal points hundreds, tens and units.

The case front has a circularly polarized filter window to eliminate glare. Zero adjustment facilities are provided. The adjustments are made accessable by removing the front assembly, zero adjustment may be made over a range of greater than +10 counts.

The meter is manufactured by Weston Instruments, Inc., Newark, New Jersey. All inquiries pertaining to operation or repair of this instrument should be directed to Weston - Newark. For a pictorial view of the meter and overall dimensions, refer to Figure 1, Outline Dimensional Drawing.

The electrical adjustments and theory of operation are similar to the Model 1292.

INSTALLATION AND OPERATING INSTRUCTIONS

PANEL MOUNTING

1. Unpack the meter and perform a visual inspection to assure that no damage has occurred during shipment or handling.

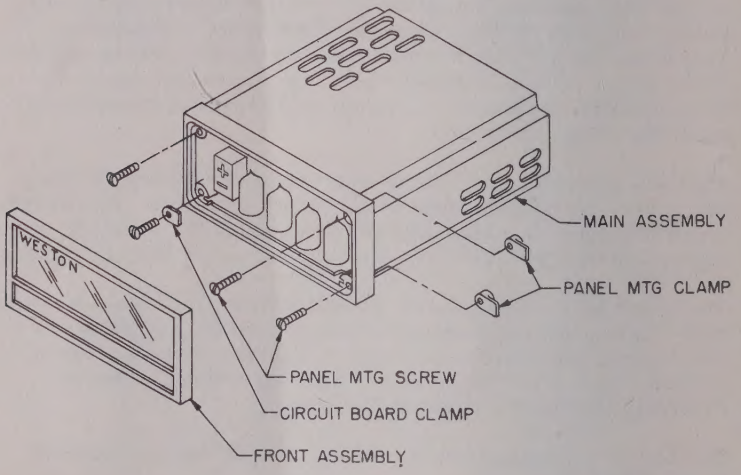


Figure 2. Meter Mounting Drawing

2. Remove front assembly. Rotate the four mounting screws (located in the four inner corners) 3 or 4 times counter clockwise to position the mounting cams correctly. Mount the main assembly (see Figure 2) on a panel 1/16 to 1/8 inch thick. The panel shall be prepared in accordance with the panel cut out dimensions as shown in Figure 3. Rotate the four mounting screws clockwise to position the mounting cams in the lock, position and secure the instrument to the panel.

3. Check the display tubes to assure that they are securely mounted to their sockets. Press loose tubes down gently to obtain a secure mounting.

4. The front assembly can be secured into position at this time. This front assembly will have to be removed to adjust and calibrate the meter.

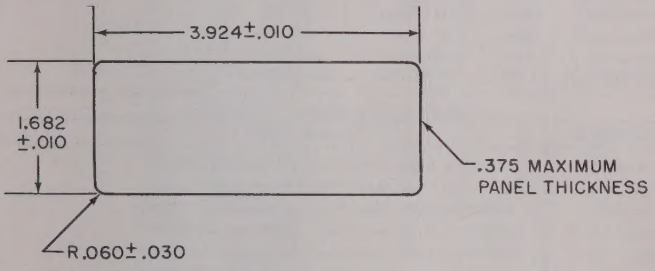
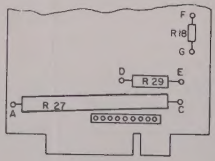


Figure 3. Panel Cut-Out Dimensions

FUNCTION & RANGE	COMPONENTS AND LOCATION BETWEEN TERMINALS		
	A - C R27	D - E R29	F - G R18
1000 Volts	269974-001	266628-001	269880-001
400 Volts	269794-001	266627-001	269880-001
40 Volts	269794-001	266481-001	269880-001
4 Volts	Open	Open	269881-001
400 Millivolts	Open	Open	269880-001
400 Milliamps	Open	264776-001	269880-001
40 Milliamps	Open	264773-001	269880-001
4.0 Milliamps	Open	264775-001	269880-001
400 Microamps	Open	266628-001	269880-001
40 Microamps	Open	266627-001	269880-001
4 Microamps	Open	266481-001	269880-001

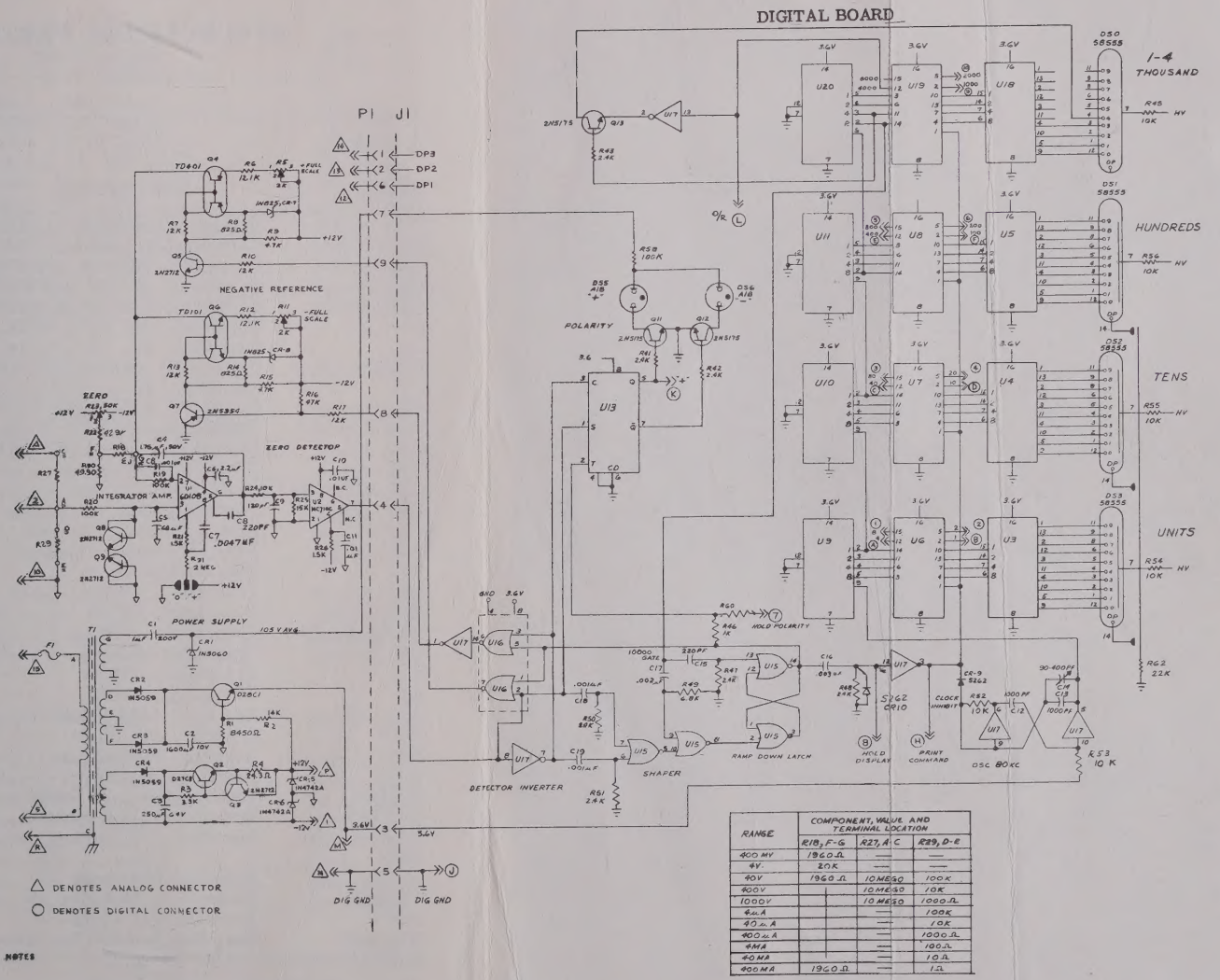
COMPONENT IDENTIFICATION TABLE	
PART NUMBER	DESCRIPTION
269881-001	RESISTOR, fixed, metal film: 20 K ohms ±1% RN55C
269880-001	RESISTOR, fixed, metal film: 1960 ohms ±1% RN55C
269974-001	RESISTOR, fixed, metal film: 10 megohms ±1% RN75C
266628-001	RESISTOR, fixed, metal film: 1000 ohms ±1% RN55C
266627-001	RESISTOR, fixed, metal film: 10 K ohms ±1% RN55C
266481-001	RESISTOR, fixed, metal film: 100 K ohms ±1% RN60C
264776-001	RESISTOR, fixed, wire wound: 1.0 ohms ±1% 2 watt
264775-001	RESISTOR, fixed, wire wound: 100 ohms ±1% 2 watt
264773-001	RESISTOR, fixed, wire wound: 10 ohms ±1% 2 watt

Components are supplied properly assembled. Refer to View A to determine the part number of components for various ranges.



VIEW A.

ANALOG BOARD



RANGE	COMPONENT, VALUE AND TERMINAL LOCATION		
	R18, F-G	R27, A-C	R29, D-E
400 MV	1960 Ω	—	—
4V	20K	—	—
40V	1960 Ω	10 MEG	100K
400V		10 MEG	10K
1000V		10 MEG	1000 Ω
4 μA		—	100K
40 μA		—	10K
400 μA		—	1000 Ω
4MA		—	100 Ω
40 MA		—	10 Ω
400 MA	1960 Ω	—	1Ω

Figure 7. Schematic Diagram

REPLACEMENT PARTS LIST

MODEL 1293

REFERENCE SYMBOL	DESCRIPTION	WESTON PART NO.
	BOARD ASSEMBLY ANALOG	270847-901
C1	Capacitor, 1.0 μf 200 WVDC	269895-001
C2	Capacitor, 1600 μf 10 WVDC	266607-001
C3	Capacitor, 250 μf 64 WVDC	266349-001
C4	Capacitor, 1.75 μf 50 WVDC	269897-001
C5	Capacitor, .68 μf 50 WVDC	270034-001
C6	Capacitor, 2.2 μf 35 WVDC	269953-001
C7	Capacitor, .0047 μf 100 WVDC	264092-001
C8	Capacitor, 220 pf 1000 WVDC	264091-001
C9	Capacitor, 120 pf 1000 WVDC	264090-001
C10, C11	Capacitor, .01 μf 100 WVDC	269899-001
C12	Capacitor, .001 μf 100 WVDC	263666-001
CR1	Diode, 1N5060	266591-001
CR2, CR3, CR4	Diode, 1N5059	266611-001
CR5, CR6	Diode, 1N4742A	264601-001
CR7, CR8	Diode, 1N825A	266309-001
F1	Fuse, 1/4 Amp	268798-001
P1	Plug Assembly	269227-901
Q1	Transistor, D28C1	268797-001
Q2	Transistor, D27C3	269902-001
Q3, Q5, Q8, Q9	Transistor, 2N2712	ND39917-001
Q4	Transistor, TD401	269904-001
Q6	Transistor, TD101	266399-001
Q7	Transistor, 2N5354	268795-001
R1	Resistor, 8450 Ohms	272482-001
R2	Resistor, 14K Ohms	269882-001
R3	Resistor, 3.3K Ohms	269890-001
R4	Resistor, 24.3 Ohms	272510-001
R5, R11	Potentiometer, 2K Ohms	269901-001
R6, R12	Resistor, 12.1 K Ohms	272426-001
R7, R10, R13, R17	Resistor, 12K Ohms	266613-001
R8, R14	Resistor, 825 Ohms	269888-001
R9, R15	Resistor, 4.7K Ohms	263652-001
R16	Resistor, 47K Ohms	264676-001
R18, R27, R29	Resistor, Selected for range per ... Table - Page 6	

REFERENCE SYMBOL	DESCRIPTION	WESTON PART NO.
R19, R20	Resistor, 100K Ohms	269885-001
R21, R26	Resistor, 1.5K Ohms	264677-001
R22	Resistor, 49.9K Ohms	269884-001
R23	Potentiometer, 50K Ohms	266407-001
R24	Resistor, 10K Ohms	269887-001
R25	Resistor, 15K Ohms	266593-001
R30	Resistor, 49.9 Ohms	269886-001
R31	Resistor, 2.0 Meg. Ohms	269932-001
T1	Transformer, Power	265659-901
U1	Microcircuit, 60108	269960-001
U2	Microcircuit, MC710CG	269903-001
	BOARD ASSEMBLY, Digital	270841-901
C12, C13	Capacitor, 1000 pf 100 WVDC	269893-001
C14	Capacitor, Trimmer (90-400 pf)	269894-001
C15	Capacitor, 220 pf	264091-001
C16	Capacitor, .003 μf 500 WVDC	264791-001
C17	Capacitor, .002 μf	266605-001
C18, C19	Capacitor, .001 μf	263666-001
CR9, CR10	Diode, S262	263643-001
DS0, DS1, DS2, DS3	Tube, Readout B58553	266601-001
DS5, DS6	Bulb, Neon, A1B	269877-001
J1	Socket Assy	269228-901
Q11, Q12, Q13	Transistor, 2N5175	266585-001
R41, R42, R43, R47, R48, R50, R51, R60	Resistor, 2.4K Ohms	266615-001
R45, R54, R55, R56	Resistor, 10K Ohms	264673-001
R46	Resistor, 1.0K Ohms	266612-001
R49	Resistor, 6.8K Ohms	269891-001
R52, R53	Resistor, 10K Ohms RN55D	269887-001
R58	Resistor, 100K Ohms	266592-001
R62	Resistor, 22K Ohms	264674-001
U3, U4, U5, U18	Microcircuit UL 9960	266397-001
U6, U7, U8, U19	Microcircuit UL9959	266595-001
U9, U10, U11, U20	Microcircuit UL9958	266596-001

REFER-ENCE SYMBOL	DESCRIPTION	WESTON PART NO.
U13	Microcircuit MA923	272479-001
U15	Microcircuit MC824P	266599-001
U16	Microcircuit MA914	268793-001
U17	Microcircuit MC889P	269896-001
XDS0, XDS1, XDS2, XDS3	Socket, Readout Tube	266602-001

WESTON EQUIPMENT WARRANTY

Weston warrants equipment of its manufacture against defective materials or workmanship for a period of one year from date of shipment.

The liability of Seller under this warranty is limited, at Seller's option, solely to repair, replacement with equivalent Weston equipment, at an appropriate credit adjustment not to exceed the original equipment sales price, of equipment returned to the Seller provided that (a) Seller is promptly notified in writing by Buyer upon discovery of defects, (b) Upon receipt of written authorization from Seller the defective equipment is returned as directed, transportation charges prepaid by Buyer, and, (c) Seller's examination of such equipment discloses to his satisfaction that defects were not caused by negligence, misuse, improper installation, accident, or unauthorized repair or alteration by the Buyer. Any modification such as changing range resistors may void this warranty.

This warranty does not include mechanical parts failing from normal usage nor does it cover limited life electrical components which deteriorate with age such as tubes, lamps, etc.

This warranty is in lieu of all other warranties, expressed or implied, including the implied warranty of fitness for a particular purpose to the original purchaser or to any other person. Seller shall not be liable for consequential damages of any kind.

The aforementioned provisions do not extend the original warranty period of any article which has been either repaired or replaced by Seller.

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